Analysis Regarding the Approach of the aspects of Resilience in the Implementation of Industry 4.0, for Employees who have had technological Unemployment

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***Abstract*— *The research aims to evaluate whether aspects of resilience are addressed in the implementation of industry 4.0, for employees who will have technological unemployment. A case study with a multinational company with more than 10,0000 employees in the automotive sector, which already has experience in the implementation of Industry 4.0 in its processes. The results show the approach used for dismissal is directed to achieving the increase in operating results. In conclusion, the theme of resilience compared to Industry 4.0 and productivity is more researched in the world, although the research has not evidenced its use by the researched company, so there is a huge opportunity for schools (Learning Industries) and aquaculture companies to direct efforts to explore the characteristics of resilience and mitigate the impacts caused by technological unemployment on people and society.*

***Keywords*— Industry 4.0, Resilience, Technological Unemployment, Schools, Learning Industries.**

I. INTRODUCTION

In a global production system the competitiveness and innovations end up having great prominence, it is sought to adopt intelligent technologies in the production system to increaseproductivity, thus reducing risks, protecting the environment, and as a result, the development of projects with better, quality, and cost-benefit, and businesses tend to thrive in this extremely competitive market.

Because of the competitiveness, several techniques and tools have been used as vectors of achievement of strategic objectives, to find a balance between the strengths and weaknesses of organizations. Among these tools, computational resources stood out due to their relationship with increased productivity through their exponential growth, helped to provide improvements in products and services, and can stand out from their competitors, which still has operational activity based on manual or mechanical processes.

Currently, the highly talked about industrial practice in the business and academic world is industry 4.0, also known as the 4th industrial revolution that is becoming a new reality, made possible by the growth of computational resources, additive manufacturing social networks digital platforms among others, can thus raise companies to productivity levels scales difficult to scale, among these expectations I filled the increase in economic growth and the generation of technological jobs where new technologiesreplacetheoperatingworkforce in many industriesof occupations(Kergroach, 2017).

The innovations caused by industry 4.0 can enhance manufacturing through time gain in production systems, improvements, and minimization of losses in processes and serviceoperations but have consequences for the generation of jobs in the present and future of new business models (Coelho, 2016; Ślusarczyk, 2018). These consequences are the motivation of this work, and the question to beanswered is:Are companies in the pursuit of competitiveness at global levels doing some analysis ofthe resilience behavior of individuals who will be affected by technology?

Initially, the research has a focus on how organizations define their processes to be replaced by robots in place of

people and whether these people were somehow prepared during their time of professional activity for this replacement, or we will be increasing social problems with more unemployment under technology.

This subject is of interest to the whole society, industrial and academic community since the replacement of these people in the labor market can be directly linked withthe knowledge that can be acquired in universities, resulting directly the ability that professionals have to deal with complexity,innovation,flexibilityand adding to this a psychosocial balance. Also, when comparing it,it is perceived that the line of interestisquite similartoproductivity and resilience,whileindustry 4.0has a very high interesting in the last 12 months in the world, according to theGoogleTrends(2020) evidenced in Figure 1 below, reinforcesthe importance on the subject, although the researches carried out in this study indicate that inIndustry 4.0 they have not been highlighted by the small number of relevant publications on the subject evidenced in the literature review.

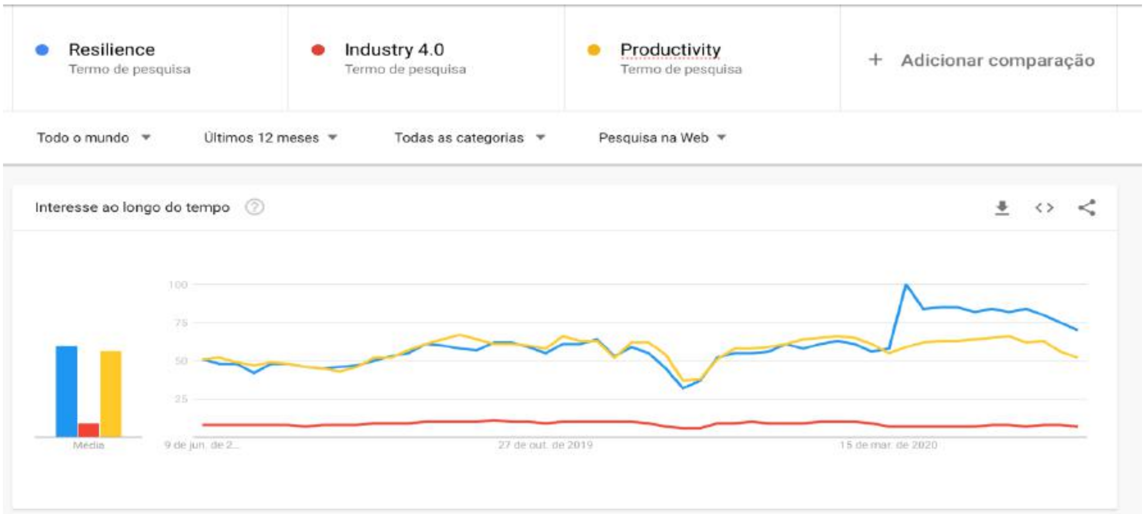

Fig.1: Comparison in 12 months of the interesting expressions: Industry 4.0, productivity, and resilience in the World.

Source: Google Trends, 2020.

When this research is conducted in Brazil, the distance between the 3 variables is not noticeable, they are walking together, as shown in Figure 2.

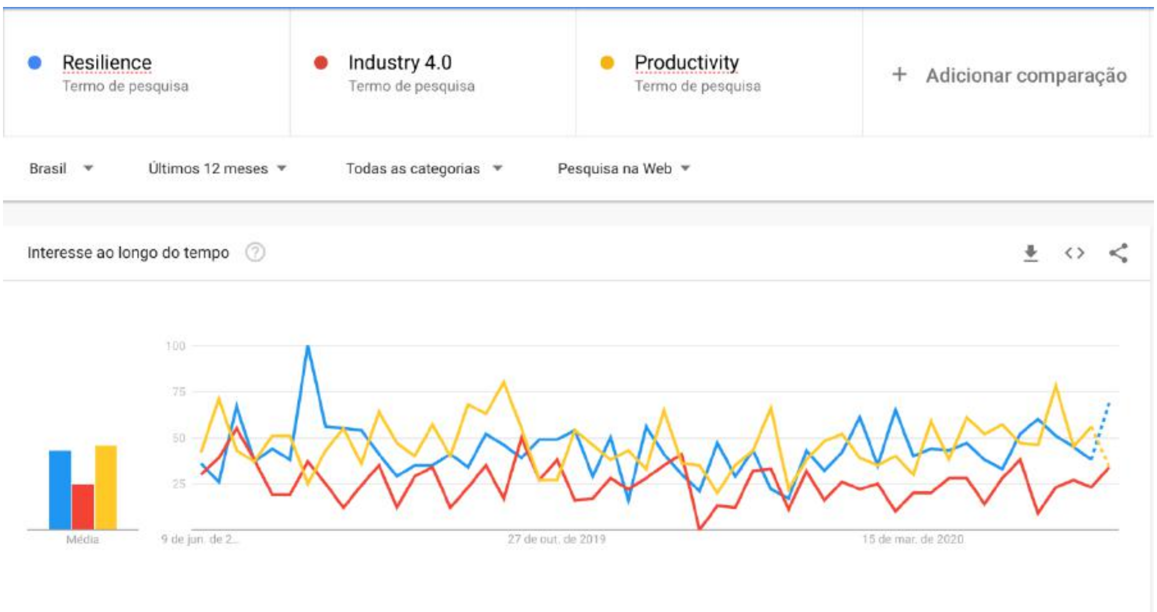

Fig.2: Comparison in 12 months of interest of expressions: Industry 4.0, productivity, and resilience in Brazil.

Source: Google Trends, 2020.

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When researched in the language Portuguese the themes are already distant and resilience has greater prominence than industry 4.0 and productivity,shown in Figure 3

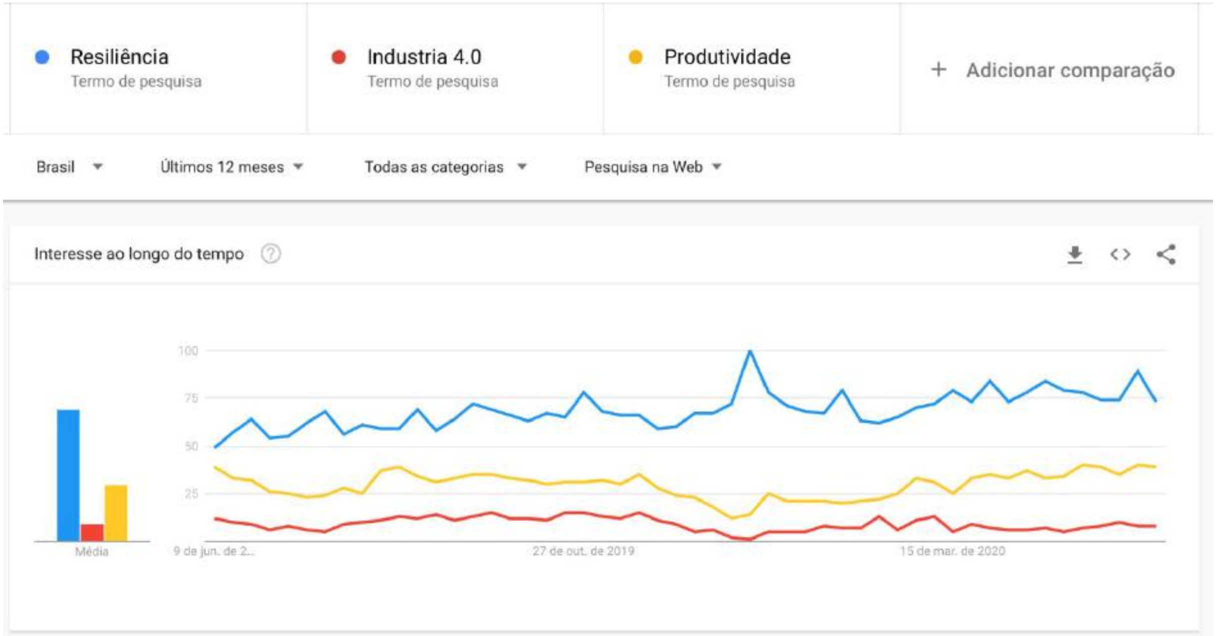

Fig.3: Comparison in 12 months of interest of expressions: Industry 4.0, productivity, and resilience in Brazil in Portuguese.

Source: Google Trends, 2020.

II. LITERATURE REVIEW

This item represents a review of the literature considering topics that helped to understand how research is

2.1 Industry 4.0

The concept of industry 4.0 as far as research is coming from Germany since 2011, to strengthen the competitiveness of German industry, can in its implementation according to Abele, Metternich, Tisch., Chryssolouris, Sih, ElMaraghy, Hummel, &Ranz (2015), Qin, Liu,&Grosvenor(2016), Ślusarczyk (2018), Dalenogare (2018), Sung (2018), Moktadir, Mithun, Kusi-Sarpong, Shaikh & Aftab (2018)cost reduction, improved performance improvement, products and services improved due to self-optimization of cyber-physical systems that communicate with workersandreal-time data exchange, decentralized and adapted decision making, possible by technological advances, enabling vertical integration along the entire value chain and intelligent production system.

The 4th RevolutionIndustry (4IR) in the work ofŚlusarczyk (2018) and Dalenogare (2018),reportsthegrowinginterestinimproving the industrythrough new technologies 4.0emerging in countries such asGermany (Industrie 4.0), France (The Nouvelle France Industrielle), Sweden (Produktion2030), Italia (FabbricaIntelligente), Belgium/Holanda (MadeDifferent), Spain (Industry sicamente4.0), UnitedStates, (Advanced Manufacturing Partnership), China, a (Made in China 2025),Áustria (Produktion der Zukunft), in Brazil, it was called "Towards Industry 4.0 through the Brazilian Industrial*Development* Agency (ABDI - Brazilian Agency for Industrial Development), understood as the new phase of the industrial era that will integrate production systems, communication through cyber-physical systems to achieve better operational performance, through reduction of setups, labor costs, materials and processing time.

Industry 4.0 concepts are proposed to enable companies to have a higher level of productivity and operational efficiency, with flexible processes and manufacturing to analyze large amounts of data in real-time, improving strategic and operational decision making linking manufacturing aspects and the virtual world, will bring computerization and interconnect to the traditional industry, combining multiple technologies, encouraging managers to think of a new business model. (Kagermann, 2015.; Dalenogare, 2018; Alcácer, Cruz-Machado, 2019).

The goal of Industrials 4.0 according to Ślusarczyk (2018), Stock&Seliger (2016), Pereira and Romero (2017) "is to achieve a higher level of operationalefficiency and productivity and also a higher level of automation", creating smart factories (environment), products and other smart devices and smart services creating a new business

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model where it substantially influences the manufacturing industry.

Paprocki (2016) cited byŚlusarczyk (2018),Baur&Wee (2015) cited bySung (2018), associate 4IR with five phenomena:

1. Digitization of processes to enable constant communication in increasing data between people, people, and devices and between the devicesthemselves;
2. More and more frequently implemented disruptive innovations, which allow a gradual increase in the efficiency and effectiveness of the functioning of the socio-economic system;
3. The realization of such machine development in such a way that they gain the ability to autonomous behavior through the use of artificial intelligence;
4. The emergence of analysis and *business* intelligencecapability;
5. New forms of human-machine interaction, such as digital instruction transfers to the physical world, such as advanced robotics and 3-D printing.

The basic feature of Industry 4.0 is to connect shop floor activities and their systems to smart grids, having their decisions controlled autonomously, being able to identify and correct failures automatically, storing knowledge and gaining predictability, reducing inactivity in their value chain, according to Sung (2018), enabling them to provide products and processes with lower cost and increasing their performance and image with society, other enabling technologies for industry 4.0 is often applied in academic works they are: Industrial Internet of Things (IIoT), Physical Cyber Systems; Digital simulations; Cybersecurity; Additive manufacturing; Collaborative robots; Big Data; Augmented reality; Horizontal and Vertical Integration of Systems; Cloud Computing and Smart Sensors (Lucizano, 2019).

These enablingtechnologies are aligned with the paradigm described by stock &Seliger (2016),Mrugalska (2017), where he describes them in 3 dimensions:

1. Horizontal integration throughout the network represents value creation during smart articulations in creating end-to-end value in various factors such as equipment, human capital, organization processes, and products throughout the product lifecycle and their adjacent cycles in a cyber-physical system, offering a new and innovative environment for intelligent business models.
2. End-to-end engineering throughout the product life cycle: Reports the connection of interdisciplinary and transdisciplinary of stakeholders with the use of Cyber-physical technology at all stages of the product life cycle, from the acquisition of the material, until the end of its useful life, considering its reuse, re-manufacturing, and recycling.
3. Vertical integration and the manufacturing system in the network: describe cross-linking and technology, within the different levels of value aggregation and hierarchy, during production processes and integrating associated processes such as marketing, sales, and technology development.

The application of these dimensions results in a system of mechatronic components, with sensors for data collection, continuously exchanging data in virtual networks in real-time in IoT and services, integrating man-machine and digital interfaces can be evidenced in Figure X in a macro perspective evolving to intelligent factories, evolving according to Qin,Liu& Grosvenor (2016), through automatic information exchanges, to a conscious and intelligent company smart enough to predict and keep the machines in a position to control and manage the production processes.

This long-range view will lead to the increased complexity of manufacturing processes at the micro and macro levels. Especially small and medium-sized manufacturing companies are uncertain about the financial effort required to acquire such new technologies and the overall impact on their business model. (Schumacher, 2016).

Smart factories must harmonize sustainable technology (Santos, Andrade, Facó, Santos &Thimóteo,2020) with reduction of negative impacts generated by technological unemployment, these psychological factors were studied under the perception of workers replaced by Robots, they do not see robots as a threat, but their replacement by people yes. (Granulo, Fuchs&Puntoni, 2019; Santos, Andrade, Facó, Santos & Thimóteo,2020).

New jobs for new human capital will require new digital skills and skills and lifelong learning from an early age, including educational profiles, brown assist in solving difficult activities for automation such as problem-solving intuitions, creativity persuasion, work in, team communication skills, possibly will be important future academic approaches (Kergroach, 2017).

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Table 1. the following presents a synthesis of articles that have been studied and addresses the topic of resilience in Industry 4.0 or not. There are several theoretical pieces of research on the theme Industry 4.0 but few technological and financial results of the implementation of the technology are still disseminated, and among the most researched topics are the use of technologies and the development of the learning industry.

Table 1- *Synthesis of the articles studied.*

Year	Authors	Theme	Country	Research	Deployment	Technological solutions	Difficulties encountered in relocating people	Conclusion
2012	Wagner, et al	The State-of-the-Art and Prospects of Learning Factories.	Germany	Secondary data	No	No	Not described	This study and associated research revealed that the terminology surrounding learning factories is still in development. The minimum set of capabilities that must be present to call the installation of a learning factory must be specified, as well as the attributes of an ideal factory learning.
2015	Abele, et al	Learning Factories for research, education, and training	Germany	Primary data	No	In	Not described	It shows that learning factories have simulations that help students understand the complexities of an organization.
2015	Sokolov et al	Integrated scheduling of material flows and information services in industry 4.0 supply networks.	Russia, Russia	Secondary data	No	No	No	In this work, nondeterministic questions were considered in Programming Dynamics where programming is interconnected

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								to the control function.
2016	Stock, T. and Selinger, G.	Opportunities for Sustainable Manufacturing in Industry 4.0	Germany	Case study	Yes	Yes. Transformation of analog signals into digital signals for data processing.	Not described	A use case for adapting a machine tool as a specific opportunity for sustainable manufacturing in Industry 4.0 has been delineated.
2016	Qin, Liu, andGrosvenor	The Categorical Framework of Manufacturing for Industry 4.0 and Beyond.	Not identified	Secondary data	Yes	Describes the SmartFactoryKL soap factory and its advantages in industry 4.0.Describes the characteristics of intelligent vehicles with a cyber-physical system reaching 80% prediction accuracy.	Yes. The production system is influenced by many different factors, which are the types of operations of ", 'Number of workstations', 'automation level', and 'system flexibility'.	With industry 4.0 the soap factory can produce the soap in any color requested by the customer. For smart vehicles that are loaded into a database, this data is sent to drivers.
2016	Erol et al	Tangible Industry 4.0: a scenario-based approach to learning for the future of production	Austria	Secondary data	No	It describes that for the learning plant there is a need for technological solutions, ICT, augmented reality systems.	Not described	The basic assumption of our approach is that human actors in a future production scenario will have specific skills to address new challenges in technological and organizational developments and business models.

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Table 1 - Synthesis of the articles studied (Continued).

Year	Authors	Theme	Country	Research	Deployment	Technological solutions	Difficulties encountered in relocating people	Conclusion
2016	Schumacher, Erol, andSihn	A maturity model for assessing Industry 4.0 readiness and maturity of manufacturing enterprises.	Austria	Secondary data	No	No	Not described	From a scientific point of view, a conceptual model of maturity of Industry 4.0 was developed. This conceptual model allows us to collect data on the development of manufacturing companies from different sectors and identify additional success factors for effective industry 4.0 strategies.
2017	Mrugalska, Beata and Wyrwicka	Towards Lean Production in Industry 4.0	Poland	Secondary data	No	No	Not described	Lean production has successfully challenged mass production practices for production systems focused on good quality products aimed at customer satisfaction, where anything that does not add value is concerned with being waste. To achieve this, it is advisable to introduce IT integration of the production level with level planning, customers, and

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								suppliers by the CPS known as "Industry 4.0".
2017	Baena, et al	Learning Factory: The Path to Industry 4.0.	Colombia	Secondary data	No	No	No	Describes that the success of learning should be geared towards the skills
2017	Tjahjono et al	What does Industry 4.0 mean to Supply Chain?	Spain	Primary Data	No	No	No	Through the analysis, the results showed that the areas that will be most affected by the introduction of Industry 4.0 are those of order fulfillment and transport logistics. Regarding order fulfillment, 53.84% of the impact of technology will be opportunities, while reminders can be opportunities or threats, depending on the context of the implementation.
2017	Bortolini et al	Assembly system design in the Industry 4.0 era: a general framework.	Italia	Secondary data	No	No	No	The application of these enabling technologies to the assembly domain results of a new generation of assembly systems, the assembly system defined here 4.0

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Table 1 - Synthesis of the articles studied (Continued).

Year	Authors	Theme	Country	Research	Deployment	Technological solutions	Difficulties encountered in relocating people	Conclusion
2018	Ślusarczyk B.	Industry 4.0 - Are we ready?	Poland	Secondary data	No	In	Lack of culture and digital training, which is indicated by half of the interviewees. Lack of clear vision or support from managers, unclear economic benefits from investments in digital technologies, and high financial investment, is the shortage of qualified staff.	Most respondents recognize the concept of industry 4.0 as a great opportunity for the development and improvement of competitiveness, in particular since its implementation is probably inevitable.
2018	Sung, T.K. (2009).	Industry 4.0: A Korea perspective.	Korea, South Korea	Primary data	No	In	IT security risk; Major investments in new technologies, Increased unemployment rate for repetitive jobs; reluctance to change by stakeholders.	Security risk in the information, which depending on the leak, impacts the reputation of the company; the education system should be changed, but it does not solve the problem of older workers;

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2018	Dalenogare et al	The expected contribution of Industry 4.0 technologies for industrial performance	Brazil	Secondary data	No	The research describes technologies that have had significant results in their implementation in industry 4.0, highlighting: engineering systems, CAD-CAM, Sensing, Big Data, additive manufacturing, Clouds.	Some technologies have been recently deployed, and there are no records of resulting benefits.	It divided its results into 2 groups: Product development technology and production technologies, showing that companies have different expectations regarding these technologies, showing that Brazilian companies have not yet taken advantage of some promising technologies developed in developed countries.
2018	Moktadirn et al	Assessing challenges for implementing Industry 4.0: Implications for process safety and environmental protection.	Bangladesh	Secondary data	Yes	No	Lack of technological infrastructure, lack of data protection, large initial investment, reduction of job opportunities because of the replacement of people, lack of qualified staff, complexity of integration of information and operational technologies	Lack of technological infrastructureinitiates a change in its layout for technological change. Invest in process safety and environmental protection. Motivate managers to adopt intelligent technologies in their processes

Table 1- Synthesis of the articles studied (Continued).

Year	Authors	Theme	Country	Research	Deployment	Technological solutions	Difficulties encountered in relocating people	Conclusion
2018	Vaidya, Ambad, andBhosle	Industry 4.0 - TheGlimpse.	India	Secondary data	No	No	No	The paper focused mainly on the concept of the fourth industrial revolution, called Industry 4.0 that allows intelligent, efficient, effective, individualized, and customized products at a reasonable cost.
2019	Granulo, Fuchs, andPuntoni	Psychological reactions to human versus robotic job replacement	Netherlands	Quantitative research	No	No	The research on workers had noobstacledescribed.	Workers believe that a replacement by robotsis has a smaller impact on their economic futurecompared to replacing them with people.
2019	Alcácer, Cruz-Machado	Scanning Industry 4.0: A Literature Review on Technologies for Manufacturing Systems.	Portugal	Secondary data	No	No		The fundamentals of IR 4.0 are the advanced automation and ICT technologies present in this review. I4.0's key challenge is to make production systems more flexible and collaborative.

2019	Castelo-Branco, Cruz-JesusandOliveira	Assessing Industry 4.0 readiness in manufacturing: Evidence for the European Union.	Portugal	Primary data	Yes	No	No	The reasons for the differences between countries in the capacity to adapt to Industry 4.0 require more research: the structure of the industrial sector, its role within each country's economy, and differences in business models or management styles, even within the same sectors.

2.2 Resilience

Resilience, in the etymological sense, is a concept used since 1620, derived from the Latin resilient, derived from the verb resilio (re+ salio) with the meanings of "jumping back", recovering, returning to "normal"(Sabbag, Bernadi Jr, Goldszmidt&Zambaldi,2010).

The concept of resilience and multidisciplinary worked by several authors and correlate with the following elements: (i) readiness and preparation, (ii) response and adaptation, and (iii) Recovery or adjustment (Bhamra, Dani & Burnard, 2011).

For Hartmann JuniorandMedeiros(2017)citing the authors Pinheiro (2004), Yunes (2003), describe that resilience is:"the possibility of developing properly, even facing many difficulties, is the basic idea that relates the aspects that define resilience, because some individuals who suffer stressful situations, overcome it by remaining healthy biologically and emotionally." The exercise of resilience may be responsible for the good cognitive functioning and mental health, reinforced by Chen, McCabe& Hyatt (2017) to quote Luthans 2002; Youssefand Luthans (2007) as "kind of positive psychological ability to improves performance" related ability to cope with major organizational changes.

The SOBRARE - Brazilian Society of Resilience (2020), conceptualizes resilience as follows:"Ability to be flexible when assigning meanings with the balance in times of difficulties and challenges oflife."

Several scales are presented in the literature such as Connor-Davidson Resilience Scale (Cd-Risc);Adolescent Resilience Scale; Deployment Risk and Resilience Inventory(DRRI); Military Social Index; A Child Psychosocial Distress Screener(CPDS); Strong Soul,an example has been reportedby Kamanchek (2012)intable 2to follow the steps to evaluate the level of resilience of professionals including areas presented by SOBRARE (2020).

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Table 2- Resilience scale

Factors	What is it?	How to purchase
Self-efficacy	Belief in the very ability to organize and perform actions required to produce desired results. Associated with self-confidence, it becomes a "fuel" for proactivity and problem-solving.	Specific training is needed to better understand situations, to become aware of what concept you make of yourself, and what your usual pattern of attitudes is. Psychotherapy can help a lot in this case, as well as the realization of projects in a systematic and planned way.
Self-control	Ability to manage emotionally in the face of unexpected situations and manage their behaviors appropriately for the different life challenges.	Seek to mature emotional behavior, since it will be this behavior that will be read by other people.
Social Competence	Ability to go in search of external support in times of stress. It encompasses both openness to receiving support and proactive search for help.	All training offered to develop leadership, ethical behavior and relationship improvement are valid. One can also practice "empathic listening", which invites the other to speak and offer greater details, postponing critical judgments; and "active listening", a process of guided inquiry. Getting involved in social projects helps develop moral awareness.
Empathy	Ability to promote both social competence and problem-solving. it means putting yourself in the place of the other, understanding the person from the frame of reference of the other.	Within resilience, being empathetic is not just putting yourself in the other's shoes and having compassion, it's knowing how to behave and put yourself in a way that considers the needs of other people involved in the situation. It is the ability to see "through the eyes" of the other person, to generate confidence and reciprocity when overcoming a given crisis.
Conquering people (Support Network)	It is the area of resilience that acts on beliefs that determine the ability to engage with others for the same cause.	Stay connected to other people. Thus, it makes it possible to aggregate and cultivate relationships, making them a consolidated and lasting support network. The purpose is to form strong support and protection networks.
Body reading	Being aware of the reactions that happen in our body refers to the understanding of the changes that occur in adverse situations and high stress.	Carefully analyze the different reactions that happen in our bodies.
Flexibility	It is related to greater tolerance of ambiguity and greater creativity. Pessimism causes low-resilience individuals to stubbornly insist on ineffective attitudes. The resilient, in contrast, is flexible. Think about options, act, and if the action is not effective, choose another option and persist.	Think straight away about yoga classes or ballroom dancing, for example. "the flexibility of the body is associated with that of the mind." In the long run, go after creativity development training, which unlocks and lets you "think outside the box."

Table 2- Resiliencescale (continued)

Factors	What is it?	How to purchase
Tenacity	It is about persistence and the ability to withstand uncomfortable or adverse situations.	Individuals with low tenacity give up easily. Sports practice helps because it improves discipline and exposes the limits of the body. It's the guy who regularly does an hour of the treadmill because he knows it's important, not because he likes it.
Troubleshooting	Characteristic of change agents, individuals prepared to diagnose problems, plan solutions, and act, without losing control of emotions. The attitude that mobilizes for action.	Good advice, for starters, is to entertain yourself with strategy games, those that make you think of solutions such as chess. but to fully develop this factor, the best solution is even the dedication to put projects on their feet — personal or professional.
Productivity	It is associated with challenges, living with uncertainties and ambiguities. It refers to the propensity to act and the search for new solutions. Reactions tend to wait for the impacts of adversity; proactive initiatives.	One solution is to look for a coachingservice. The guidance of more experienced professionals can teach you how to be agile and give the right answers.
Temperance	It is associated with the control of impulsivity and anger. It means a greater ability to regulate emotions while maintaining serenity in difficult situations.	Palliative measures, such as listening to a song, moving away from a little and throwing water on the face, are valid. In the long run, meditation, physical conditioning, and psychotherapy to solve self-esteem problems.
Optimism or self-confidence	On the scale of resilience, optimism is a competence resulting from the union of three others: social competence, proactivity, and self-efficacy.	All recommended activities for social competence, proactivity, and self-efficacy are useful in this case. Moreover, it is having a positive attitude towards life.
Environmental analysis	It is understood as the area of resilience that acts in the beliefs that determine the ability to read carefully the environment. Capturing all clues that demonstrate a situation of risk or vulnerability.	Resilience in this area promotes flexibility for proper adaptation to a given context, to position itself in times of change, to focus on solutions, and to manage with balance the information obtained in the environment.
Sense of life	Ability to understand the vital purpose of life.	It promotes enrichment of the value of life, strengthening and empowering the person to preserve his life to the fullest.

Source:KamanchekAdapt (2012) and SOBRARE (2020).

It is perceived that the term resilience is used quite broadly although all of them are related to the individual's ability to return to a stable state after a rupture, also being applied in organizations when there is some interruption inprocesses, through acceptance of reality and the ability to improvise(Bhamra,Dani& Burnard,2011).

III. METHODOLOGY

This research began with the definition of a relevant theme for an article in the area of higher education. The authors understand that evaluating, helpingthe resilience of workers who may lose their jobs because of Industry 4.0isimportant, by proposing this idea provokes a fundamental change in the perception of companies about the impacts caused by this change and how to make conspicuous the implementation with reduction of social impacts. In addition, martins methodology (2010) was increased to measure the importance of the theme using the following formula: $M = \sqrt[3]{7(V) \times 10 (I) \times 10 (O)} = 8.87$(where: V = Viability; I = Importance; O =

Originality). For this formula, a viable theme was considered above 6.

The structure of the work methodologypresented in the funnel diagram in Figure 4.

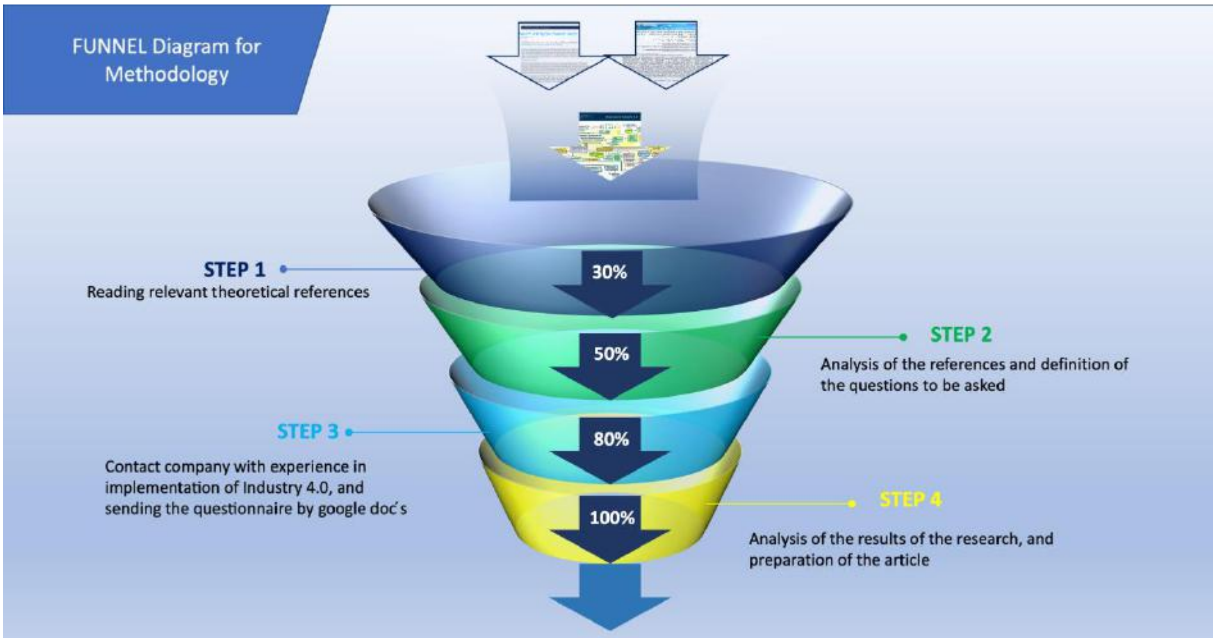

Fig.4: Funnel diagram for research methodology

Source: The authors.

The steps represented in the funnel diagram where the percentages represent the time of each phasebefore the article is ready to describe the methodology are: Step 1 - a literature review in relevant sources to provide a theoretical basis for the research, which according to Gil (2010) and Ruiz (1996) will allow informing the current situation of the theme; Step 2 - The literature review had the role of assisting in the elaboration of the key issues to be addressed in step 3 (Vergara, 2000); Step 3 – sending the questionnaire through the Google doc's (CooperandSchindler, 2003), Linkedin contacts and professional relationship was used to enhance the research time that was impaired byCOVID-19,or by the lack of interest andthe industrial sectorin completing research, which resulted in the case study method in a multinational company; Step 4 analyze of the questionnaire and choice of the journal to verify the writing pattern of the article.

The qualitative method was determined because it is the case study that according to Gil (2010) is classified according to its general purpose and objectives, which is basic and exploratory and descriptive. After all, it familiarizes the researcher with the theme and fills gaps in knowledge through business practice. Its approach is direct by interrogating and requesting information from a given group of people, characterizing qualitative analysis concerning the approach. As for nature, it is classified as applied, as it is focused on the acquisition of knowledge for a specific purpose.

IV. RESULTS AND DISCUSSIONS

The company surveyed is multinational in the automotive sector in the region of ABC / São Paulo / Brazil with has close to 10,000 employees, the company believes to be prepared to enter Industry 4.0 and does not realize any threat to its competitiveness

The person was responsible for the research Industry4.0 as A way to intelligently join technology, working between various areas, generating information and productdata, process, and supply chain themost efficient, enabling more *insights* and communication ofthe data in real-time.

The concepts of Industry 4.0 were implanted in machines and process, the reason was to make them more competitive, this implementation presented as benefits: productivity gains, reduction of variability in the process and increase in financial performance.

The barriers encountered during the deployment were: lack of adequate manpower, general reluctance to change by stakeholders, loss of many jobs to automated and controlled processes, large investments in technologies and complexity of integration of information and operational technology.

The criteria used for the implementation of Industry 4.0areprocess bottlenecks, level of rejection or deviations of tolerance, customer complaints, constantmaintenance, risks to worker´s health, low cost of replacing workers with machines/technologies, and quality assurance.

Among the resilience factors described by Kamanchek (2012) and SOBRARE (2020), none of them is used as an evaluative factor for the replacement of employee´s by technology, but during the employee´s stay in the company, the same seeks to develop Tenacity, Temperance, Productivity/Proactivity, Self-efficiency a problem-solving skills.

There is no type of aid for employees resulting from technological unemployment, for a replacement in the market,so the result of the use of technology in Industry 4.0, within the company, for employees is the dismissal.

4.1 Final considerations

The study evaluated how companies use the characteristics that reinforce resilience, to define technological unemployment, which was found in the case study, industry strategies 4.0 take into account the increase in performance, it is the human being, who had an investment in their skills over time, this can cause difficulties in proposing the consequences of some types of innovations, without attenuating the results caused socially and psychologically.

It is noticed that the theme resilience is highly sought after, as shown in Figure 1, but evidence in the literature and the case, the study does not corroborate its use at the time of dismissals due to technologies.

4.2 Theoretical implications

The research's contribution is to assess whether when defining a cut for technological reasons resilience is taken into account, since technically employees should perform similarly, making employee resilience and after no longer being employee's objectives of studies, in the implementation of Industry 4.0.

4.3 Practical implications

The work has practical implications when presenting the possibility of developing a characteristic of strengthening resilience in schools and companies even in a laconic way that can mitigate problems of employee relocation whether within the company or outside.

4.4 Limitations and suggestions for future research

The work also in acquiescence with transversal and interdisciplinary activities, shares the difficulty of responses of the target population, although the theme is of business interest and thus corroboration should be easier. Therefore, the proposal is to replicate the case study for multiple case studies, or with greater sampling, to go from a qualitative to quantitative research.

A survey of employees who were the result of technological unemployment could provide schools (learning industries) and enterprise with information on which path to be developed in the resilience of active workers mitigating the social consequences resulting from technology.

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